

Detection of Fake News using Machine Learning

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ABSTRACT

The problem of Fake news has evolved much faster in the recent years. Social media has dramatically changed its reach and impact as a whole. On one hand, it's low cost, and easy accessibility with rapid share of information draws more attention of people to read news from it. On the other hand, it enables wide spread of Fake news, which are nothing but false information to mislead people. As a result, automating Fake news detection has become crucial in order to maintain robust online and social media. Artificial Intelligence and Machine learning are the recent technologies to recognize and eliminate the Fake news with the help of Algorithms.

In this work, Machine-learning methods are employed to detect the credibility of news based on the text content and responses given by users. A comparison is made to show that the latter is more reliable and effective in terms of determining all kinds of news. The method applied in this work is highest posterior probability of tokens in the response of two classes. It uses frequency-based features to train the Algorithms including supervised learning algorithms and classification algorithm technique. The work also highlights a wide range of features established recently in this area that gives a clearer picture for the automation of this problem. An experiment was conducted in the work to match the lists of Fake related words in the text of responses, to find out whether the response- based detection is a good measure to determine the credibility or not.

KEYWORDS: Dataset, confusion matrix, logistic regression, supervised learning algorithm

I. INTRODUCTION

In the digital world, Fake news has quickly become a society problem, being used to propagate false or rumor information in order to change people's behavior. Erroneous information consisting of deliberated phony news spread through broadcasts like TV, Radio, and Press etc. The phony news is started since 13th century B C example: Rameses the Great was portrayed a fairy information saying that Battle of Kadesh as a victory for the Egyptians and also we all studied in high school about Pope Sixtus IV's false information "Blood Libel". The whoopers continued till now 21st century and the misleading of people by their fake information will be increased simultaneously increasing in the usage of internet.

In the 21st century, the main intention of the fake news is to gain financially. According to the 2019 study by researchers at Princeton University, the sharing of false information or articles is high related to education, politics. The 11% of people above age of 65 shares the maximum false information and 3% of people among age 18-29 do the same.

Considering the 2016 U.S. presidential election, the intentional outspread of digital misinformation, especially on public channel medium such as Twitter and Face book, has created remarkable fascination over various regulations. In wide range, this fascination disgrace an extensive agitation to the acceptance of "faux information" has escalated political diffraction, declined civilian's faith, and

compromised republic. Lately, one or two monograph encountered an endeavor to dwell the acceptance of faux information on public channel, realizing that unveiling is infrequent in contrast to other kinds of information indexes and generally engineered misinformation broadcasted on public channel is adequately prevalent to constitute an emergency catastrophe.

In India, the fake news are taken or considered as misinformation, disinformation inside the nation in which it is outspread via expression of civilians, standard channel and lately through all kinds of digital communication like modified videos, uncertain advertisements, memes and rumors which are propagated by public channel. Faux information reach via public channel inside the nation has become a significant issue, Besides the prospective of which directing to mass brutality, As the occasion in 2018 as an outcome of outspread misinformation in public channel minimum of 30 civilians were assassinated.

II. LITERATURE SURVEY

In [1] The main aim of the paper was to axiomatically detect faux information by performing tests on two reliable datasets which are credbank and theme. The paper focus on the models that are assembled to oppose the experts model which are depending on assessment and models made on clustered dataset, this is performed by considering the twitter content in which the source is mainly taken from the

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Buzz feed's dataset of faux information. The automatic systems are used to organize the documented twitter content during a digitalized section to characterize the twitter content into realistic news information. An Inquiry of various highpoints has helped many individuals, for instance, while surveying the accuracy on internet based life stories and judgments are made over proved and faux information.

comprehensive amidst formerly, politically traditional Americans. In spite of these findings, various analysts and other observers still commend that deliberately In [2] The author tries to focus on channel medium information classification for mining the public medium and issues regarding the text categories most significantly text including etiquette. In this method, the author conveys by building a model that genesis the information in public medium. In this paper, the author introduces TRACEMINER which is an approach to immerse the users of public channel in structure of public network and also creates a LSTM-RNN model to indicate the way of information. Trace miner approach is preferable for explicating actual world dataset than standard approaches and provides high classification accuracy. In this approach, many messages are given as inlet and category as outlet. This outlook is different from standard outlook because they straightly focus in modeling the data and forecast is made. The paper provides optimization methods to trace miner to guarantee the correctness and examine the performance of the actual-world public network information.

In [3] In the paper, the author's main focus is on categorizing the information on identifying the amount of exactness in the information. The main aim is on technologies that are taken for faux information identification, includes two main categories for linguistic cue approach assessment (with machine learning) and network analysis approach. For training classifiers, the methods make use of machine learning techniques for suitable analysis. Combination of linguistic cue and machine learning on network based developmental data can be done as future development. Structured dataset such as text are focused.

In [4] The paper identifies the authenticity of a news story by investigating an ancillary activity to imitate the distinguished evidence of information, which is considered as position recognition. In a news story, the main aim is to make a conclusion the relevance of the content and its case. The combination of neural network, facts and the main highlights generates an efficient answer for the problem which is executed for the actual idea. The paper utilizes the repetitive model by including neural network and also considers the authentic highpoints from the weighted ngram bag of words and manually made highpoints with the help of highpoint design. At last, the model performs the false news challenge experiments by combining the attributes and hence classification of body-head point pair of information as accept, contradict, discuss or not related.

III. PROBLEM STATEMENT

Social media is used for rapidly spreading false news these days. A famous quote from Wiston Churchill goes by "A lie gets halfway around the world before the truth features an opportunity to urge its pants on." With an outsized size of active users on social media, the rumors/fake stories spread like a wildfire. Response on such kind of news can prove to be a decisive factor to term the news as "fake" or "real". User

provides evidences in the form of multimedia or web links to support or deny the claim.

A. EXISTING SYSTEM

The existing model make use of naïve bayes algorithm where in the datasets are taken from an online platform such as twitter, Facebook etc and are given as inputs directly without any proper training of datasets. Because of this the accuracy given by the model will also be very low as the output cannot be predicted properly without knowing the actual news is fake or real. The training for datasets are provided randomly without verifying the fact of information.

Limitations of Existing Model:

- Real examples are not trained to the model which results in inaccuracy of the result.
- Naïve Bayes classifier does not support large datasets.
- The datasets are not accurate.
- Source of the datasets are taken usually from the online platforms.

B. PROPOSED SYSTEM

The proposed model uses machine learning algorithm which are more reliable than the Naïve Bayes classifier. It makes use of NLP techniques such as TF-IDF, Bag of words and vectorization algorithm for better results. The datasets are taken from the real-world example i.e. real-world incidents are considered and then from those incidents the datasets are trained. The datasets are collected from the authorized author who authenticates the news as fake or real by clarifying personally. The authenticated datasets are stored in the official community for data scientists to publish their datasets.

NLP techniques are utilized which relies on machine learning and as always the machine learning algorithms predict the output fairly.

Advantages of Proposed Model:

- Pre-processing of the datasets are done which increases the accuracy level.
- Datasets are from the genuine source therefore the datasets are trustworthy. TF-IDF vectorization is used which gives the frequency of the words used in a document to the other similar documents.
- Feature extraction of the data is done which helps in predicting the result.
- The accuracy of the model is relatively high compared to the model based on naïve Bayes algorithm, the model is reliable with the machine learning algorithms.

IV. METHODOLOGY

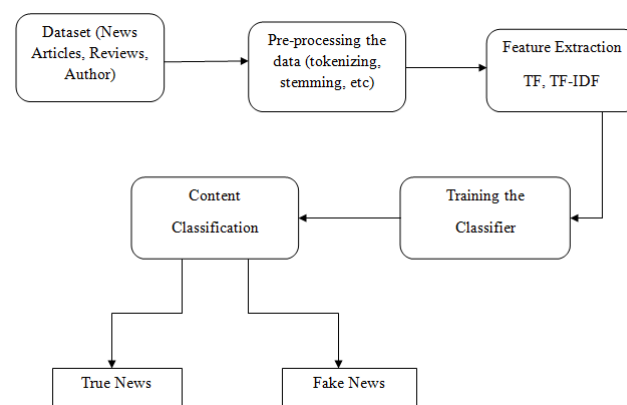


Fig: Design Flow of the Model

The design flow of the proposed model is as shown in the above Fig. As the flow represents how the steps are taking place. The steps are as follows

- It starts with the large datasets which are taken from the official data scientists' community for the fake news detection model.
- Datasets are then pre-processed which is an important and major step while doing the machine learning projects because, this is the step where the data gets transformed or encoded so that the machine can easily understand and parse the data.
- Cleaning of the datasets involves the following
 - Removing Punctuation from the datasets.
 - Tokenization to give structure to the unstructured datasets.
 - Stopwords are removed from the datasets.
- Pre-processing data involves the following
 - Stemming of the data.
 - Lemmatizing of the data.

Once the pre-processing is done, the next step is Feature extraction of data and Vectorizing data which is a process of encoding text into integers so that machines can understand the data. Vectorizing data in the proposed model involves the following

- Bag-of-Words
- N-Grams are simply all combinations of adjacent words or letters of length n that we can find in our source text.
- TF-IDF computes "relative frequency" that a word appears in a document compared to its frequency across all documents.
- The next step is training the classifier or in other words training the algorithm for the above datasets and based on the requirement, type of algorithms can be used and trained accordingly.
- Finally, by using Classification algorithm the prediction is done as whether the news is fake or real.

V. EVALUATION TECHNIQUE

The performance of algorithms for faux information detection problem can be evaluated by different evaluation techniques. Here, the most widely used metrics for faux news detection is demonstrated. Various existing techniques contemplate the faux news issue as a classification problem in which the prediction are done as whether the news information is false or not:

- True Positive (TP): while predicted false news article are in fact recorded as fake news;
- True Negative (TN): while predicted true news article are in fact recorded as real news;
- False Negative (FN): while predicted true news article are in fact recorded as fake news;
- False Positive (FP): while predicted false news article are in fact recorded as real news.

Concerning this as a classification problem, the following can be defined,

$$\text{Precision} = \frac{|T P|}{|T P| + |F P|}$$

$$\text{Recall} = \frac{|T P|}{|T P| + |F N|}$$

$$F1 = \frac{2 * (\text{Precision} * \text{Recall})}{(\text{Precision} + \text{Recall})}$$

$$\text{Accuracy} = \frac{|T P| + |T N|}{|T P| + |T N| + |F P| + |F N|}$$

The above mentioned techniques are generally utilized in the machine learning area and permit to demonstrate the performance of a classifier from various standpoints. Especially, accuracy measures the likeness intervening predicted faux news and actual faux news. Precision computes the fraction of all identified faux news which are in fact recorded as faux news, describing the major issue of recognizing which news is false.

VI. RESULTS

	Fake (Predicted) 0	Real (Predicted) 1
Fake (Actual) 0	TN 2558	FP 6
Real (Actual) 1	FN 853	TP 1783

Table 6.1 confusion matrix of multinomial Naïve Bayes classifier

	Fake (Predicted) 0	Real (Predicted) 1
Fake (Actual) 0	TN 2494	FP 70
Real (Actual) 1	FN 45	TP 2591

Table 6.2 confusion matrix of logistic regression

CONCLUSION

To identify the fake news is important and the model which predicts the difference between fake news and real news are possible these days as the technology is hitting its peak. The proposed model gives the accuracy of 83% using supervised learning technique and TF-IDF vectorization. Adding more data to the dataset will test the consistency of the performance thereby increasing trust of users on the system. In addition, gathering real news that almost appears as Fake news will improve the training of the model.

References

- [1] Buntain, Cody, and Jennifer Golbeck. "Automatically Identifying Fake News in Popular Twitter Threads." Smart Cloud (Smart Cloud), 2017 IEEE International Conference on. IEEE, 2017.
- [2] Wu, Liang, and Huan Liu. "Tracing Fake-News Footprints: Characterizing Social Media Messages by How They Propagate." (2018).
- [3] Conroy, N. J., Rubin, V. L., & Chen, Y. (2015). Automatic deception detection: Methods for finding fake news. Proceedings of the Association for Information Science and Technology, 52(1).
- [4] Bhatt, Gaurav, et al. "Combining Neural, Statistical and External Features for Fake News Stance Identification." Companion of the online Conference 2018 on the online Conference 2018. International World Wide Web Conferences Steering Committee, 2018.